

The Piccolo – looking after the instrument

Each woodwind instrument has particular maintenance problems; Piccolos are the woodwind instruments that are most affected by water build-up due to condensation from the players breath; the Piccolo player must take particular care to avoid problems caused by the condensation.

Why condensation occurs

The air a player blows into a woodwind instrument contains a great deal of water vapour. The temperature of this air is approximately 38 degrees Celsius. The temperature of the instrument (even when warmed up to room temperature) is approximately 20 degrees Celsius. The water vapour in the player's breath condensates on the inner surface of the instrument, which is cool compared to the temperature of the air.

Where condensation occurs

The air leaving the player is hot and humid and the water vapour immediately condensates onto the surface area at the top of the bore. The air continues down the bore becoming drier and cooler as the water vapour condensates out. The air finally passes out of the first free open tone-hole.

What happens to the condensation

The condensation at the top of the bore forms equally over the inner surface of the bore. Gravity forces the microscopic droplets of condensation to run down the sides of the bore to meet at the bottom of the bore where a rivulet of condensation forms. This rivulet runs down the length of the bore and drips out the end of the instrument. Gradually during playing, the whole instrument warms up to a playing temperature and an equilibrium is reached where the internal surface of the bore is warm enough so only a minimum of condensation occurs. The Piccolo is small enough to reach an equal temperature throughout its' length but virtually all other instruments will have a temperature gradient with the temperature of the body of the instrument being lower the further away from the top of the bore.

Why condensation is a greater problem for Piccolo players

All woodwind players have to cope with water caused by condensation but it is a particularly serious problem for Piccolo players for three reasons.

Firstly, the length of bore between where the player's breath enters the instrument, and the first free open-tone hole, is very short on a Piccolo. On a clarinet most the water vapour condensates in the mouthpiece and barrel and the top section of the top joint, and the now drier air proceeds down the bore; likewise on a flute and saxophone there is a reasonable length of bore where condensation can occur drying out the air before it reaches the pads. On a Piccolo the length of bore is much shorter – and the surface area of the bore is far less – so the air is not dried out before reaching the tone-holes and in fact nearly the whole body of the Piccolo is affected by hot and humid air.

Secondly, with less surface area available the condensation quickly builds up to form droplets. Because the whole body of the Piccolo is affected by hot humid air these droplets are forming throughout the bore and adjacent to the tone holes. Water forms the same size droplets regardless of the size of the instrument. If a droplet runs into the pad of a saxophone it will get absorbed into the surface leather of the pad and make no noticeable swelling of the pad. On a Piccolo a droplet of water will dramatically affect the pad making it swell.

Thirdly, the rivulet caused by the condensation is roughly the same for each woodwind instrument; however, the size of the Piccolo bore is much smaller than for other woodwinds and therefore the tone-holes are much closer to the bottom of the bore, so there is a much greater chance of water running into the tone holes.

What the player can do to minimize these problems

1. Make sure the instrument is thoroughly warmed before playing – ***not by blowing into it***, but by holding it gently in closed hands for a couple of minutes.
2. Carefully swab out the instrument after it has been played for a few minutes - I prefer to use a piece of good quality paper towel threaded in the end of the tuning rod because this absorbs the moisture rather than pushes it down the bore.
3. During a performance, if the instrument is not being played it should be held carefully (to keep it warm) and in such a way that the head-joint is slightly higher than the body so that water can run down the bottom of the bore without running into the tone-holes. If the instrument cannot be held then place it in its open case with the head joint slightly higher than the body.
4. If water does get on to the pads it should be swabbed out immediately (with a piece of good quality paper towel kept handily in the case) and then the Piccolo should be held for a few minutes with all fingers closing the keys.

A safe method of assembly

It is often during assembly that the instrument gets damaged so it's worth checking that your method of assembly does not put undue strain on the mechanism. Outlined below is a safe method of assembly.

1. Make sure the tenon cork is adequately greased.
2. Grip the head joint in your left hand.
3. Grip the body, between the trills and the tenon, with the thumb and forefinger of your right hand.
4. Gently twist the body of the Piccolo onto the head-joint.

Servicing and repair

The instrument should be regularly serviced to ensure it is operating correctly – how often depends on how much it is used, but on average it should be serviced every couple of years. The pads, corks, and felts on the instrument (and also the adhesives which keeps these items in place) deteriorate over time. On older or poorer quality instruments the mechanism itself starts to wear and keys can become loose or jammed.

Usually such deterioration is gradual and the player subconsciously compensates by blowing harder and pressing harder on the keys. Without servicing the deterioration continues: the quality of tone diminishes; the instrument becomes less responsive; the tuning becomes unreliable. Eventually something major goes wrong and the instrument becomes unplayable and in need of considerable repair. Players often blame themselves for the poor sound they produce when really it is the condition of the instrument that is causing problems.

Test your Piccolo with the following exercises, in all cases you should be able to play the notes without squeezing the keys hard or blowing hard: C to Bb using thumb key; B to A; A to G; G to F#; G to F; E to D.